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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/629,888

07/29/2003

David W. Bartley

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03/23/2006

BAKER & DANIELS LLP
300 NORTH MERIDIAN STREET
SUITE 2700
INDIANAPOLIS, IN 46204

EXAMINER

OH, TAYLOR V

ART UNIT

PAPER NUMBER

1625

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,888

Applicant(s)

BARTLEY ET AL.

Examiner

Taylor Victor Oh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17-32, 34 and 35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17-32, 34 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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In view of the Appeal Brief filed on 12/16/05, PROSECUTION IS HEREBY REOPENED. A new Office Action sets forth below.

The Status of Claims:

Claims 1-15, 17-32, and 34-35 are pending.

Claims 1-15, 17-32, and 34-35 have been rejected.

DETAILED ACTION

1. Claims 1-15, 17-32, and 34-35 are under consideration in this Office Action.

Priority

2. None.

Drawings

3. None.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1,15,19, 32, and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1,15,19, 32, and 34 and their corresponding dependent claims, the term " the tetrabromobenzoate ester-containing product comprises " is recited. The expression is vague and indefinite because the phrase " product comprises" would mean that there are other components besides the tetrabromobenzoate ester ; there is uncertainty as to what other compounds are present in the product. Furthermore, It is well-settled that the term " containing " do not exclude the presence of other ingredients than the one recited. Ex parte Muench , 79 USPQ 92 (PTO Bd. App. 1948). Therefore, an appropriate correction is required.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-15, 17-32, and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill et al (U.S. 5,637, 757) in view of Rose et al (US 5,728,760) and Finley (U.S. 4,375,551).

Hill et al discloses the method of preparing tetrabromobenzoate esters in the following example (see col. 8 ,lines 10-27):

**Synthesis of 2-ethylhexyltetrabromobenzoate from
tetrabromophthalic anhydride in 2-ethoxyethylether
solvent**

Tetrabromophthalic anhydride (1391 g., 3.00 moles), 2ethylhexanol (469 g, 3.60 moles), 2-ethoxyethylether (771 g, 4.75 moles), and sodium bicarbonate (25 g, 0.30 moles) were charged to a stirred, glass vessel. The mixture was brought to reflux, with the water of reaction being collected in a Dean-Stark trap. After CO₂ evolution had ceased (approximately 3 hours), the reaction was cooled and filtered to remove the catalyst. The 2-ethoxyethylether and excess 2-ethylhexanol were stripped off under vacuum yielding a clear, amber liquid product. GLC assay 85.0% tetrabromobenzoate, 1.6% tetrabromophthalic diester; OBr 56.99%; TGA 5% wt. loss 209° C., Gardner color 11.

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Furthermore, the boiling point for the inert solvents between 160 to 230⁰ C is recommended (see col. 5 ,lines 62-64).

With respect to the unspecific reaction temperature for the partial esterification, Hill et al discloses that the alcohols with the boiling points between 100⁰ and 160⁰ C may be advantageous (see col. 4, lines 26-28) in the reaction process, which implies that the esterification can be conducted near that temperature range in addition to other temperature range of from 160 to 230⁰ C ; furthermore, the Hill et al has indicated that the reaction process is actually involved in a two step procedure : 1. esterification of the anhydride ;2. decarboxylation to yield the tetrabromobenzoate (see col. 1 ,lines 46-48).

In addition, Hill et al teaches the incorporation of 2-ethylhexyltetrabromobenzoate to unsaturated polyester resin as the flame retarded polymer resin component in the combustibility test (see col. 10 , lines 31-42) as well as the use of tetrabromobenzoate in the flame retardant reaction injection molded polyurethane (see col. 9 ,lines 35-48).

However, the instant invention differs from the prior art in that there is no specific temperature at which the reaction favors partial esterification over complete esterification to form a tetrabromophthalate half-ester intermediate mixture; the claimed temperature range 190-205 ⁰C that favors decarboxylation over esterification ; the claimed reactor includes a plurality of heated reactors in series.

Rose et al teaches the method of making a brombenzoate compound useful for producing flame retarded polyurethanes in the followings:

**Synthesis of 2-ethylhexyltetrabromobenzoate From
2,3,4,5-tetrabromobenzoic Acid**

2,3,4,5-Tetrabromobenzoic acid (438 g, 1.0 mole) prepared via the decarboxylation of tetrabromophthalic anhydride, 2-ethylhexanol (195 g, 1.5 moles) and titanium isopropoxide (2.2 g, 0.008 mole) were charged to a stirred, glass vessel. The mixture was heated at 200° C. in nitrogen atmosphere under stirring for 8 hours with the water of reaction being collected in a Dean-Stark trap. The resulting dark-brown reaction mixture was cooled to 90° C. and neutralized by stirring with solid $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ (5 wt % on the reaction mixture) at 90° C. for 1 hour. Following a steam-strip to remove excess 2-ethylhexanol, the product was filtered to remove the insoluble solid contaminants. A clear, dark-brown liquid was obtained (533 g, 97% yield). This crude product was distilled at 192°–194° C. and 0.1–0.2 mmHg. A total of 527 g of pale yellow, clear liquid was obtained (99% recovery). GLC assay 96.2% tetrabromobenzoate; OBr 56.6% (58.1% theory); acidity 0.15 meq.KOH/100 g; TGA 5% wt. loss at 271° C.; Gardner Color 3.

Finley teaches a process of preparing allylic esters of tetrabromophthalic acid in the presence of sodium carbonate (see col. 2 ,line 31) from tetrabromophthalic anhydride in a two step procedure (see col. 1 ,lines 62-65). The first and second steps of the process can be carried out in the same and different vessels; the reaction temperature of the first step is from 90 to 95° C (see col. 3 ,lines 30-32). Finley has offered guidance that the rate at which the semi-esterification in the first step depends on the temperature of the reactants (see col. 3 ,lines 24-26).

The Hill et al expressly has disclosed the method of preparing tetrabromobenzoate esters from tetrabromophthalic anhydride in the presence of

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sodium carbonate (see col. 5 ,line 39), which is actually involved in a two step procedure (esterification of the anhydride and the subsequent decarboxylation to yield the tetrabromobenzoate) (see col. 1 ,lines 46-48). Similarly, the Rose et al expressly has disclosed the method of preparing tetrabromobenzoate esters from tetrabromophthalic anhydride in the presence of decarboxylating sodium carbonate catalyst at 200⁰C (see col. 5 ,lines 45-67). Also, Finley does teach the process of preparing allylic esters of tetrabromophthalic acid in the presence of sodium carbonate (see col. 2 ,line 31) from tetrabromophthalic anhydride in a two step procedure (see col. 1 ,lines 62-65) in the same reactor or different reactors (see col. 3 ,line 24);furthermore, the first step of the process can be conducted at a temperature of from 90 to 95⁰ C (see col. 3 ,lines 30-32).

All the processes have been commonly involved in the method of preparing tetrabromobenzoate esters from tetrabromophthalic anhydride in the presence of sodium carbonate; Hill et al expressly teaches that it is in the presence of sodium carbonate that the tetrabromobenzoate ester is prepared from tetrabromophthalic anhydride ; similarly, the Rose et al expressly has disclosed that it is at 200⁰C which tetrabromobenzoate esters is prepared from tetrabromophthalic anhydride in the presence of sodium carbonate at 200⁰C ; Finley does teach that the process of preparing allylic esters of tetrabromophthalic acid is conducted in the presence of sodium carbonate at a optimum temperature of from 90 to 95⁰ C (see col. 3 ,lines 30-

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32) in the first step. From this , there is a teaching of an equivalence among the Hill et al and the Rose et al the Finley processes with respect to the use of sodium carbonate.

Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the Rose's et al decarboxylating temperature along with the limitations of the Finley's optimum first-step reaction temperature and the use of plural reactors into the Hill et al process in order to speed up the reaction process and react all the reactants to its completion. This is because the skilled artisan in the art would expect such a combination of the Rose's et al decarboxylating temperature, the Finley's optimum first-step reaction temperature parameter and the use of plural reactors into the Hill et al process to be successful and to be efficient as the guidance shown in the Finley.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

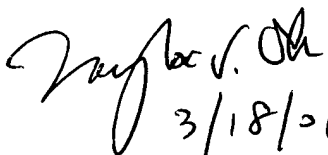
(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

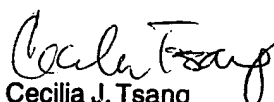
A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


3/18/06


Cecilia J. Tsang
Supervisory Patent Examiner
Technology Center 1600